The Office of Environment, Safety and Health and its Office of Nuclear and Facility Safety (NFS) publishes the Operating Experience Weekly Summary to promote safety throughout the Department of Energy (DOE) complex by encouraging feedback of operating experience and encouraging the exchange of information among DOE nuclear facilities.

The Weekly Summary should be processed as an external source of lessons-learned information as described in DOE-STD-7501-96, *Development of DOE Lessons Learned Programs*.

To issue the Weekly Summary in a timely manner, the Office of Operating Experience Analysis and Feedback (OEAF) relies on preliminary information such as daily operations reports, notification reports, and, time permitting, conversations with cognizant facility or DOE field office staff. If you have additional pertinent information or identify inaccurate statements in the summary, please bring this to the attention of Dick Trevillian, 301-903-3074, or Internet address dick.trevillian@hq.doe.gov, so we may issue a correction.

Internet addresses provided in the Weekly Summary will be formatted as lower-case alphabetical characters. Numerical characters will be specifically defined when used in Internet addresses. The Internet Uniform Resource Locator (URL) for the Weekly Summary is http://www.tis.eh.doe.gov/web/oeaf/oe_weekly/oe_weekly.html. If you experience difficulties accessing the Weekly Summary at this URL, please contact Mark Mortensen at 208-525-3753 for assistance.

Readers are cautioned that review of the Weekly Summary should not be a substitute for a thorough review of the interim and final occurrence reports.

Operating Experience Weekly Summary 97-03

January 10 through January 16, 1997

Table of Contents

EVENTS

1. AMMONIA EXPOSURE FROM OVERPRESSURIZED DRUM AT FERNALD ENVIRONMENTAL MANAGEMENT PROJECT

On January 8, 1997, at the Fernald Environmental Management Project, a hazardous waste worker was loosening a bolt on a 110-gallon drum ring when the lid blew off, striking the ceiling 14 feet above the worker and coming to rest on the floor 3 feet away. The worker was exposed to ammonia fumes and became disoriented. The drums were being opened in a posted contamination area. The radiation work permit required anti-contamination clothing, but did not require respiratory protection. The facility manager suspended work in the area and ordered remaining personnel to leave the building. The worker complained of having a headache. She was taken to an off-site medical facility, where she was diagnosed with ammonia exposure. Pressurized drum lids can present several personnel hazards including: (1) possible injury from an expelled drum lid or burst drum; (2) exposure to radioactive or hazardous contents of the drum; or (3) exposure to pyrophoric materials, which can ignite and burn. (ORPS Report OH-FN-FDF-FEMP-197-0003)

An industrial hygiene technician responded to the scene and tested for ammonia in the area. The technician found ammonia concentrations of 15 ppm to 25 ppm at the top of the drum. The Occupational Safety and Health Administration short-term exposure limit (15-minute exposure) for ammonia is 35 ppm. It does not appear that the employee will suffer any long-term effects from this event.

Investigators determined the waste drum contained incinerator cinders. They also determined the drum was bulging, but the worker did not use a lid-restraining device.

The facility manager directed a safety stand-down to review this event and directed the following corrective actions.

- Waste programs personnel will change the drum-opening procedure to state that any drum showing evidence of bulging must have a lid-restraining device placed on it before it is moved or handled.

- Operations supervisors and operators will conduct daily safety meetings to discuss safety concerns regarding jobs in progress or to be performed.

- Operations supervisors initiated an operators log that supervisors will review daily to improve communications between supervisors and operators.

NFS has reported drum pressurization events in numerous Weekly Summaries.

- Weekly Summary 96-42 reported two events involving lids that were blown off pressurized drums when the locking rings were loosened. On October 9, 1996, at the Paducah Plant, a waste sampler loosened a locking ring with a hammer, and the ring, the lid, and some contents blew out of the drum. On October 7, 1996, at the Hanford Tank Farms, an operator loosened and moved the locking ring on a drum, and the lid flew 2 to 3 feet into the air and fell back on the drum. There was no radiological contamination or injuries in either occurrence. At Paducah, the drums contained degrading wood that generated methane gases; the drum at Hanford contained

decaying weeds and soil that produced methane gases. (ORPS Reports ORO--LMES-PGDPENVRES-1996-0002 and RL--PHMC-TANKFARM-1996-0076)

- Weekly Summary 95-02 reported that on January 10, 1995, at the Pacific Northwest Laboratory, workers loosened a drum lid's clamp ring, and the lid forcibly dislodged from the drum and hit an overhead light fixture. Four, 120-ml bottles were thrown from the drum and the contents spilled on the floor. Health physics personnel performed radiological smears of the workers and found 1,000 to 10,000 dpm alpha contamination on their shoes. They also surveyed the spill area and detected 150,000 dpm alpha and 5,000 dpm beta-gamma contamination. (ORPS Report RL--PNL-PNLBOPER-1995-0002)

Operating Experience Analysis and Feedback (OEAF) reviewed the Occurrence Reporting and Processing System (ORPS) database for pressurized drums and found 54 events DOE-wide. Figure1-1 shows the distribution of root causes reported for these events.

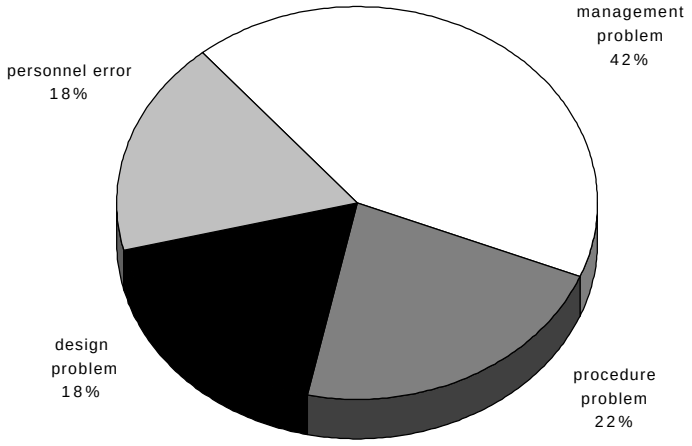

Figure 1-1. Distribution of Root Causes for Pressurized Drums[1]

Management problems contributed to 42 percent of root causes for pressurized drums. Table 1-1. shows breakdown of the causal codes by percentage.

[1] OEAF engineers screened the ORPS database for occurrences using the narrative search "pressur@ and drum@ and deform@ or bulge@ or lid" and found 54 events. A 100 percent review of these reports found 30 related events. The accuracy of each pie slice is within ± 5.9 percent.

TABLE 1-1. CONTRIBUTION TO MANAGEMENT PROBLEMS BY CAUSAL CODES

Cause Code	Percent
Inadequate administrative control	44%
Work organization/Planning deficiency	33%
Policy not adequately defined, disseminated, or enforced	23%

These events relate to drums containing various materials; however, personnel also need to be aware that pressurization can occur in new and empty drums. On June 9, 1995, the Rust Geotech Inc., occurrence reporting program manager issued a lessons-learned document regarding the unexpected pressurization of new drums in response to an event at the Grand Junction project office. On May 17, 1995, a radiation technician was removing the lid of a new, 55-gallon, open-top metal drum when pressure buildup within the drum caused the lid to blow off. The technician was preparing the drum for storage of solid mixed waste. There was no visible indication of pressurization, such as bulging or distortion. The employee was not injured, and no property damage resulted. (Lessons Learned List Server Item Number 1995-Al-GEO-01)

In February 1993, NFS issued DOE/NS-0013, Safety Notice 93-1, “Fire, Explosion, and High-Pressure Hazards Associated with Waste Drums and Containers.” This notice describes lessons learned on safe storage and handling of waste containers and drums. The notice specifically discusses handling, storing, venting, and opening containers suspected of being pressurized or containing flammable vapors. Safety Notice 93-1 can be obtained by contacting the Info Center, (301) 903-0449, or by writing to ES&H Information Center, U.S. Department of Energy, EH-72/Suite 100, CXXI/3, Germantown, MD 20874.

KEYWORDS: pressurized drum, safety

FUNCTIONAL AREAS: industrial safety, materials handling/storage

2. INADEQUATE ENGINEERING REVIEW OF MODIFICATION PACKAGE RESULTS IN BUILDING EVACUATION

On January 9, 1997, at the Hanford site, all Plutonium Finishing Plant personnel evacuated in response to a criticality alarm caused by short-circuited, 24-volt dc wiring. The short-circuit occurred during replacement of a criticality alarm panel. When the horns sounded, the plant was in a no fissile material movement status because of the replacement work. Plant personnel immediately evacuated the building and reported to the staging area All personnel were accounted for. An inadequately researched modification unnecessarily activated the criticality safety alarm and caused evacuation of a building. (ORPS Report RL--PHMC-PFP-1997-0003)

Maintenance personnel were modifying criticality safety alarm panels to correct problems associated with a backup battery system. Workers were modifying the first of nine criticality alarm panels. When the alarm sounded, the emergency director conducted recovery actions because he believed an actual criticality event had occurred.

The building manager led a critique. Critique members determined a cognizant engineer performed a technical review of the criticality alarm panel replacement. However, he based his review on personal knowledge and focused only on the power supply wiring. Critique members also determined there were no additional review requirements for the work package beyond the cognizant engineer's review. When maintenance personnel pulled the signal wiring to the panel, it shorted, causing a signal to initiate a criticality safety alarm. Because the building shift personnel had not been prepared for the possibility that the alarm might sound, they correctly responded to the criticality alarm as if a criticality event occurred, and evacuated.

NFS reported criticality alarm problems in Weekly Summaries 96-32, 96-31, 96-30, 96-28, 94-42, and 92-22. Weekly Summary 96-30 reported that 10 storage rooms at Rocky Flats were neither analyzed nor equipped with criticality detectors and alarms as required by the operational safety limits when modifications to erect walls were made and missions for specific rooms changed. Engineers are analyzing the storage areas and attempting to find better control design documentation for criticality detectors. (ORPS Report RFO--KHLL-SOLIDWST-1996-0106)

Operating Experience Analysis and Feedback (OEAF) engineers reviewed the Occurrence Reporting and Processing System (ORPS) and found 150 events DOE-wide since January 1995 resulting from safety equipment degradation caused by inadequacies in technical reviews. Figure 2-1 shows the distribution of root causes reported and indicates that "management problem" is the predominant cause.

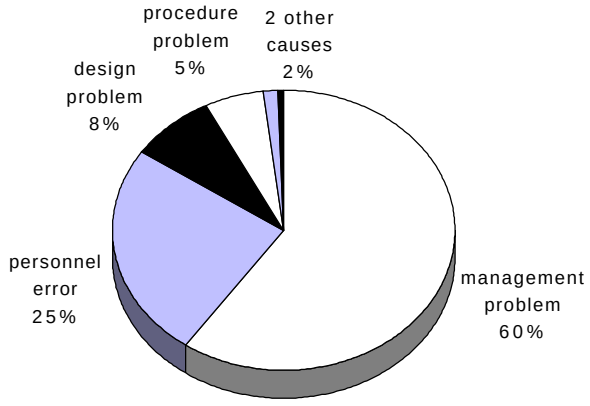

Figure 2-1. Root Causes for Equipment Degradation Events DOE-Wide Caused by Inadequate Technical Reviews [1]

Table 2-1 shows the breakdown of the management problem causes reported as a percentage. Inadequate administrative control and policy problem accounted for 61 percent of the events with the root cause reported as management problem.

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1 OEAF engineers screened the ORPS database for Nature of Occurrence "01c+01f" (safety status degradation and vital structure/system/component degradation) and for the narrative "technical+engineer@ AND review" in the Description of Cause, for the Discovery Dates 1/1/95 through 1/1/97 and found 150 events. Of these events, 149 reported a root cause. Based on a random sampling of 25 events, accuracy of each slice is within ± 6 percent.

TABLE 2-1. BREAKDOWN OF MANAGEMENT PROBLEM CAUSES DOE-WIDE FOR SAFETY EQUIPMENT DEGRADATION ATTRIBUTED TO INADEQUATE TECHNICAL REVIEW

Cause Code	Percent
Inadequate administrative control	36
Policy problem	25
Work planning deficiency	18
Other management problem	12
Inadequate supervision	7
Improper resource allocation	2

This event illustrates the importance of thorough technical reviews of modification work packages. The implementation of a modification can disrupt operations and cause challenges to safety systems. In this event, the possibility of an alarm sounding while replacing the panel was not addressed. More than 50 people from this facility evacuated outside into severe cold, and each person lost between 2 and 4 hours of work time. Facility managers should encourage detailed technical reviews of changes to safety systems. Commercial nuclear facility maintenance planners use probabilistic safety assessments to characterize activity risks to plant operation and schedule the activities accordingly to minimize the potential impact on people, power production needs, and other planned activities.

DOE-STD-1073-93, *Guide for Operational Configuration Management Program, Including the Adjunct Programs of Design Reconstitution and Material Condition and Aging Management, Parts 1 and 2,* addresses modification technical reviews as part of the change control element. Section 1.3.4.2 of the standard recommends that changes be reviewed and approved by the design authority prior to implementation. The section states these reviews should evaluate safety, environmental, and mission impacts and should determine post-implementation acceptance criteria.

KEYWORDS: criticality alarm, evacuation

FUNCTIONAL AREAS: instrument and control, engineering support

3. UNAUTHORIZED MODIFICATION TO BREAKER OPERATORS

On January 8, 1997, at the Rocky Flats Environmental Technology Site, during a building electrical walk-down, a building manager found several external electric circuit breaker operators (handles) that had been replaced without authorization or the required planning and coordination with other building activities. The plastic operators are mounted on the front of the breaker and manipulate the operating switch. Replacement required a worker to open the panels, exposing him to energized wires. Investigators found no authorization to perform the work and determined written procedures for the work were not available or used. Facility modification without proper controls can result in hazards to the technicians performing the work and in unauthorized configuration changes that lower safety margins. (ORPS Report RFO--KHLL-NONPUOPS1-1997-0002)

The area manager led a fact-finding meeting and determined that the work request to change the seven breaker operators had stalled in the work-planning phase. Investigators determined a shift operating engineer changed the plastic operators using operators he had removed from spare breakers. He did not obtain proper work authorization and did not use a procedure for the disassembly and re-assembly of the electric panels. The maintenance manager indicated that changing the plastic operators exposes energized wiring inside the cases and electricians use a lockout/tagout to perform this work. The operations manager directed maintenance personnel to check the operators to determine if they were installed correctly.

Operating Experience Analysis and Feedback (OEAF) engineers reviewed the Occurrence Reporting and Processing System (ORPS) and found 376 event reports citing unauthorized modification work DOE-wide since January 1995. Figure 3-1 shows the root cause reported by facility managers for 268 of these events.

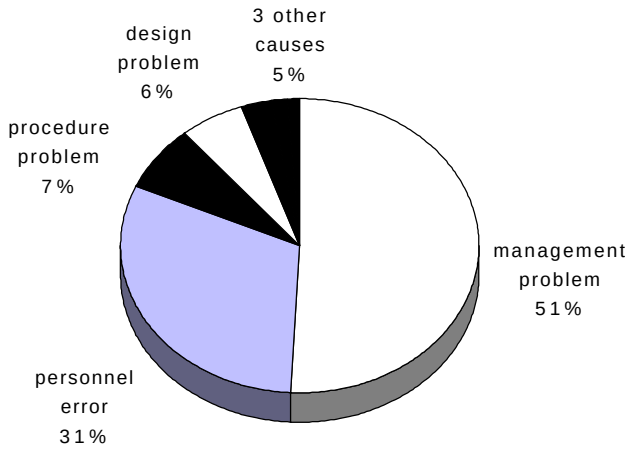

Figure 3-1. Root Causes for Unauthorized Modification Events DOE-Wide[1]

Table 3-1 provides a breakdown of the cause codes reported as “management problem.” The table shows that 40 percent of the events with a root cause of management problem were the result of inadequate administrative control.

[1] OEAF engineers screened the ORPS database for Description of Occurrence “modif@+alter@+unauthoriz@” for Discovery Dates 1/1/95 through 1/1/97 and found 376 events. Of these events, 353 reported root cause and 85 reports that listed the cause as equipment errors were deleted from the data. Based on a random sampling of 25 events, accuracy of each slice is within ± 5 percent.

TABLE 3-1. BREAKDOWN OF MANAGEMENT PROBLEM CAUSE CODES FOR UNAUTHORIZED MODIFICATION EVENTS DOE-WIDE

Cause Code	Percent
Inadequate administrative control	40
Work planning deficiency	23
Policy problem	22
Other management problem	12
Inadequate supervision	2
Improper resource allocation	1

This event highlights the importance of effectively enforcing work and modification control programs. Whether it is considered maintenance or an "identical replacement" modification, replacement part installation should not proceed until all appropriate organizations have reviewed the methods of installation and changes to design to ensure program compliance and safety. Administrative controls requiring authorization and operations planning before installing modifications should have prevented this occurrence.

This event underscores the need for strong controls in completing, installing, and testing modifications. The disregard for the engineering reviews, operational scheduling and coordination required to perform the modification and return the breakers to service overshadows the value of completing the work. DOE 5480.19, *Conduct of Operations Requirements For DOE Facilities*, chapter VIII, "Control Of Equipment and System Status," states that DOE facilities are required to establish administrative control programs to handle configuration changes resulting from maintenance, modifications, and testing activities. DOE-STD-1073-93, *Guide for Operational Configuration Management Program, Including the Adjunct Programs of Design Reconstitution and Material Condition and Aging Management, Parts 1 and 2,* addresses the modification technical reviews needed as part of the change control element. Section 1.3.4.2 of the standard recommends that changes be reviewed and approved by the design authority prior to implementation. The section states these reviews should evaluate safety, environmental, and mission impacts and should determine post-implementation acceptance criteria.

KEYWORDS: breaker, procedure, work control

FUNCTIONAL AREAS: work planning, electrical maintenance, configuration control

4. INADEQUATE LOCKOUT ALLOWED ELECTRICIANS TO WORK ON ENERGIZED PANEL

On January 8, 1997, at the Savannah River Tritium Facility, a lockout coordinator mistakenly used a previously generated and approved lockout for an Uninterruptible Power Supply (UPS) to provide protection for work on a UPS power distribution panel. The pre-existing lockout was intended for scheduled vendor repair of the UPS and did not isolate line power to the power distribution panel. Construction electricians cut a hole in the panel and installed a 2-inch conduit in an area where exposed, energized, 208-volt wiring existed. The coordinator incorrectly assumed the conduit was to be installed in the UPS equipment bay versus the power distribution panel. The pre-existing lockout did not

provide electrical isolation to the panel and could have resulted in injury or equipment damage. (ORPS Report SR--WSRC-TRIT-1997-0001)

A construction electrical foreman submitted a request to lockout power to the distribution panel for the UPS panel so he could install the conduit. The foreman then discussed the lockout requirements with the lockout coordinator. After hearing the request, the coordinator assumed the lockout was for the UPS panel and chose to use the pre-existing lockout. Operators isolated the UPS and installed the lockout. Investigators believe construction electricians incorrectly performed a voltage check that led them to believe the distribution panel was de-energized. They performed the work without incident, re-installed the panel cover, and had the lockout removed. The facility manager suspended all work under electrical lockouts pending a critique of the event.

Investigators determined the lockout request contained the correct equipment number, but the equipment description was not clear. The request referred to the UPS panel, not the distribution panel. Investigators also determined the UPS panel and the power distribution panel equipment numbers are identical, except the number for the distribution panel contains one additional digit. These issues made the lockout request confusing to the coordinator. The electrician who performed the zero energy check wore bulky low-voltage gloves and used a multi-function digital meter. Investigators believe he may have accidentally depressed a button and caused the meter to read zero while testing for voltage.

Critique members determined that personnel error (inattention to detail) was both the direct and root cause of the event. Suggested corrective actions from the critique included: (1) developing a plan for routing paperwork for approvals of lockouts and work packages; (2) evaluating the need to improve the nomenclature used for equipment labeling; and (3) re-enacting the voltage test performed on the distribution panel to determine if power was present and if the voltage tester was adequate.

This event underscores the need for lockout coordinators to completely understand lockout requests and to ensure that the lockout/tagout addresses all isolation boundaries. It is also important for the worker to verify these boundaries and to perform a zero energy check. Personnel performing zero energy checks on electrical equipment should use only approved test equipment that has been verified operable and should know where in the system to perform the checks. DOE-STD-1030-96, *Guide to Good Practices for Lockouts and Tagouts*, states that every isolation from an energy source must be verified. The initial verification should include a review of pertinent controlled drawings or manuals and a hands-on check of the equipment to help identify obscure sources of power.

Facility managers should review DOE/EH-0540, Safety Notice No. 96-05, "Lockout/Tagout Programs." The notice summarizes lockout/tagout events at DOE facilities, provides lessons learned and recommended practices, and identifies lockout/tagout program requirements. The *Hazard and Barrier Analysis Guide*, developed by the Office of Operating Experience Analysis and Feedback, includes a hazard-barrier matrix that shows the lockout/tagout as the most effective barrier against injury. When implemented properly, lockout/tagout

provides a high probability (greater than 99 percent) of success for risk reduction. Safety Notice 96-05 can be obtained by contacting the Info Center, (301) 903-0449, or by writing to ES&H Information Center, U.S. Department of Energy, EH-72/Suite 100, CXXI/3, Germantown, MD 20874.

KEYWORDS: lockout and tagout, uninterruptible-power supply, energized equipment

FUNCTIONAL AREAS: operations, construction

5. WORKER CONTACTS ENERGIZED 13.8-KV LINE WITH FISH TAPE

On January 7, 1997, at the Oak Ridge Y-12 Site, a subcontractor communications technician inserted a fiberglass "fish tape" (a device used for pulling cable) into the wrong conduit where it contacted an energized 13.8-kV electrical switch box. When he realized that the tape was inside energized equipment, the technician immediately stopped work and contacted his supervisor. The technician was installing communication cables using approved work package drawings. However, one of the drawings incorrectly showed a 4-inch conduit, rather than the 3-inch one the technician was supposed to access. An incorrect drawing resulted in an electrical near miss. If the fish tape had been metal, personnel injury or equipment damage could have resulted. (ORPS Report ORO--USW-ORFICNY12-1997-0001)

The communications technician examined the work package drawings and saw that the cable was supposed to run from a pole through an underground conduit into the building. When he examined the pole he found a 3-inch conduit, not the 4-inch conduit specified in the drawings. He then examined another pole identified on the drawings and found that it contained a 4-inch conduit. Assuming this was the correct conduit, he inserted his fish tape, and it went into the 13.8-kV electrical switch box. The Y-12 plant shift superintendent dispatched a high-voltage crew to the scene. The crew electrically locked-out the building, opened the switch box, and removed the fish tape.

Investigators determined that, in addition to indicating the incorrect conduit size, the drawings were marked with an arrow pointing to the wrong pole. Investigators believe this penciled annotation may have been made to indicate that the pole was not the correct one; however, it made the drawing less clear. Investigators also determined that the 4-inch conduit was not labeled to indicate that it fed a 13.8-kV panel. Investigators postulated that an electrical shock may have been avoided because of the communications subcontractor's policy of using fiberglass, rather than metal, fish tapes.

The facility manager specified corrective actions that included: (1) implementing a design change notice to correct the drawings; (2) issuing a letter to the communications subcontractor regarding stopping work when questions arise about the work package or drawings; and (3) installing a label on the conduit to the 13.8-kV panel.

Operating Experience Analysis and Feedback engineers reviewed the Occurrence Reporting and Processing System for events involving the use of fish tapes and found the following similar events.

- On December 7, 1995, at Rocky Flats, a subcontractor fed a fish tape through the wrong junction box and conduit into a live 480-volt switchgear, causing the circuit to trip, which in turn caused a local power outage. No injuries occurred because a ground-fault interrupter instantly tripped the breaker. Investigators

determined that the occurrence resulted from personnel error by the subcontractor and lack of management oversight. (ORPS Report RFO--KHLL-UTILITIES-1995-0012)

- On September 22, 1993, at the Mound Plant, two electricians were pulling new wire into a conduit when their fish tape rubbed against the front of a tritium monitor, changing the calibration potentiometer position and causing a high-level alarm to sound. (ORPS Report ALO-DA-EGGM-EGGMAT01-1993-0012)

- On February 14, 1992, at the Idaho National Engineering Laboratory, electricians were pulling wire through a conduit for a hydraulic scissor-lift when their metal fish tape contacted the terminals of a solenoid causing an arc. The arc melted a hydraulic supply line and caused leaking hydraulic fluid to catch fire. (ORPS Report ID--MKF-MOUITEMS-1992-0001)

- On October 24, 1991, at Sandia National Laboratory, an electrical construction subcontractor was installing a new circuit in an existing panel when his metal fish tape contacted an energized 480-volt line. A ground fault was created, blowing fuses on the primary side of a transformer. The subcontractor was not injured. (ORPS Report ALO-KO-SNL-TA4-1991-1009)

This event illustrates the need for work planners and supervisors to ensure that work package drawings are correct and accurately describe the work activity. Once drawings are approved, they must be controlled to prevent unauthorized alterations. DOE-STD-1050-93, *Guideline to Good Practices for Planning, Scheduling and Coordination of Maintenance at DOE Nuclear Facilities,* section 3.1.1.3, states that the primary objective of work planning is to identify all technical and administrative requirements for a work activity and provide the materials, tools, and support activities needed to perform the work. This would include providing accurate drawings. This event also identifies two other important issues. First, personnel performing work activities should be directed to stop work any time there is confusion with the work instructions, drawings, equipment, or location. Proceeding without contacting a foreman, supervisor, or manager to resolve questions can result in accidents. Second, workers need to exercise care when using fish tapes to pull wire or locate pathways. Because the tapes “travel,” they can be difficult to control and are usually out of the worker’s sight.

KEYWORDS: energized equipment, cable, conduit, work package

FUNCTIONAL AREAS: work planning, construction

6. CONDUIT EJECTED FROM GRAPPLE UNIT STRIKES WORKER IN THE BACK

On January 7, 1997, at the Fernald Environmental Management Project, a piece of steel conduit was ejected from scrap metal being lifted by a hydraulic grappling unit and struck a worker in the back. The worker was spraying water on a pile of metal to minimize dust and was standing 30 feet from the pile. The conduit was approximately 3 feet long and 1-1/2-inches in diameter. It flew in a high, arcing path toward the worker. The worker stated he saw the conduit coming toward him and attempted to run away. He was transported by ambulance to an area hospital for evaluation. He suffered a contusion to the lower left quadrant of his back. The facility manager suspended all operations at the project.

Workers should be aware that material and equipment lifts create the potential for ejected or falling objects and may pose safety hazards. (ORPS Report OH-FN-FDF-FEMP-1997-0004)

Investigators reported that workers used a grapple attachment on a track-hoe to remove contaminated scrap steel from a demolition project and stack it for storage. The incident occurred as the track-hoe operator was lifting the scrap metal. The conduit ejected from the side of the grapple as the operator closed the grapple jaws to secure the load.
Investigators determined that this type of work has been ongoing since 1989, with no similar incidents. Investigators also determined that the worker was 30 feet away and upwind of the pile to minimize the potential for radioactive material inhalation. They determined that the work plan did not include safety distance requirements other than maintaining a safe distance from the swing radius of the grapple arm. As a corrective action, the facility manager directed that the pile of metal be sprayed before and after moving the metal and that personnel be removed from the area during movement.

Operating Experience Analysis and Feedback reviewed the Occurrence Reporting and Processing System and found the following similar events.

- On May 17, 1995, at the Los Alamos National Laboratory, a worker received a laceration on his forehead when a 20-foot section of pipe fell 15 feet onto his hard hat, rebounded off the ground, and hit him on the forehead. The pipe was being lowered to the ground when it slipped out of the J-hook and past the safety latch. The worker was taken to the medical center, where he was treated and released. Investigators determined that the safety latch on the J-hook was damaged. This allowed it to be moved sideways and over the end of the point of the J-hook, permitting the pipe to slip out. (ORPS Report ALO-LA-LANL-PHYSTECH-1995-0005)

- On January 13, 1995, at Argonne National Laboratory—East, a glancing blow from a piece of falling construction material injured a construction worker. A crane operator was repositioning a concrete bucket when the crane line dislodged a decking support joist. The worker saw the joist and attempted to move out of the way as it fell to the surface, where he was spreading concrete. The joist struck the worker on the side of his hard hat, lacerating his ear lobe and the area behind his ear. The worker was transported to a hospital where he received eight stitches and was sent home. The direct cause was reported as inattention to potential hazards in the working environment by the foreman in charge of the work being performed; specifically, inattention to overhead hazards. (ORPS Report CH-AA-ANLE-ANLEAPS-1995-0002)

The Statistical Abstract of the United States-1994, published by the U. S. Department of Commerce, states that based on the 1992 Census of Fatal Occupational Injuries, 558 fatalities occurred as a result of being struck by objects. This represented 9.2 percent of all work-related fatalities in 1992.

OEAF engineers reviewed the CAIRS system and found 526 events throughout DOE in 1996 where injuries occurred from objects hitting, striking, falling, or being ejected. These events resulted in 4,079 lost work days and cost DOE over $4,278,00.

This event underscores the importance of using effective work control practices and job planning and being alert to potential hazards. Safety and health hazard analysis must be included in the work control process to help prevent injuries. In construction areas or areas where lifting operations are ongoing, personnel not involved in the actual operations

need to ensure they are at safe distances from the work. DOE 0 440.1, *Worker Protection Management for DOE Federal and Contractor Employees*, states that the contractor must identify workplace hazards and evaluate the risk of associated worker injury or illness. DOE 4330.4B, *Maintenance Management Program*, section 8.3.1, provides guidelines on work control systems and procedures. The Order requires using control procedures to help personnel understand the requirements for working safely.

KEYWORDS: grapple, injury

FUNCTIONAL AREAS: decontamination and decommissioning, industrial safety

7. EXCEEDING SAMPLE HOLD TIMES RESULTS IN NOTICE OF VIOLATION

On January 8, 1997, the South Carolina Department of Health and Environmental Control issued a Notice of Violation to Westinghouse Savannah River Corporation (WSRC) and the Department of Energy, Savannah River Site, for a violation of the site National Pollutant Discharge Elimination System permit. The notice cited failure to submit valid test results for acute toxicity and fecal coliform at two discharge outfalls for the November 1996, discharge monitoring report. Samples for these parameters exceeded hold times (the time from sample to analysis); therefore, they were not valid for compliance purposes. WSRC must provide a written response to the South Carolina Department of Health and Environmental Control within 10 days of receipt of the notice. The response must contain an explanation for the violation and identify measures that have been or will be taken to ensure compliance. Analytical results from both samples with the invalid hold times were within a normal range, and there were no known process upsets. Based on the information available, no environmental damage would have resulted. (ORPS Report SR--WSRC-ESH-1997-0001)

A contract laboratory, located about 2 hours from the site, performs National Pollutant Discharge Elimination System sample analyses. A courier picks up the samples at Savannah River and transports them to the laboratory. The acute toxicity sample from the central sanitary plant outfall exceeded the allowable 36-hour hold time by 27 days. The fecal coliform sample from the P-area sanitary facility outfall exceeded the allowable 6-hour hold time by 1 hour and 15 minutes.

Operators pulled samples for acute toxicity, a chronic toxicity renewal, and other required samples. The laboratory analyst expected the renewal samples, but he overlooked the check mark on the chain-of-custody form indicating an acute toxicity analysis. He did not perform the analysis. Because the sample was for November and the problem was not found until December, resampling was not possible. Investigators determined the cause was inattention by the laboratory analyst and an “unclear” chain-of-custody sheet.

Operators pulled the fecal coliform sample and immediately shut down and drained the P-area sanitary system. A field engineer forgot to make a reminder call to the laboratory to send a courier to pick up the sample. The courier delivered the samples after the hold time expired. Because the P-area system was shut down, replacement samples could not be taken. Investigators determined the apparent cause was lack of communication between the laboratory and the field engineer. This was complicated by operators shutting down the system before confirming the samples had been run.

On December 16, 1996, the assistant laboratory director for the contract laboratory issued a report identifying the hold-time oversight. The letter stated that a quality control system would be used to prevent recurrence. The quality control system will require the analyst and a supervisor to review chain-of-custody documentation. The redundant review will ensure that all analytical parameters are identified. WSRC will evaluate revising the analysis request form to make it more user-friendly. Certification of an on-site laboratory to perform fecal coliform analysis will be pursued as a long-term corrective action.

The facility manager for Environment Safety and Health Programs responded to the notice using the instructions provided in Secretary of Energy Hazel O'Leary's August 18, 1993, memorandum, "Guidance on Reporting Procedures for Enforcement Actions Related to Violations of Environmental Requirements." This memorandum to secretarial officers and managers of DOE operations offices provides guidance for responding to enforcements against the Department and its contractors. This Notice of Violation was an enforcement against the contractor and required a response to the following items.

- the nature of the alleged violation and the environmental threat posed thereby
- whether the alleged violation has been corrected or is continuing
- the basis for the regulatory authority's discovery of the alleged violation
- whether fines or penalties are being assessed and, if so, the amount

The memorandum states that the information needed to respond to these items may be included in the occurrence notification report but must still be provided to the associate deputy secretary for Field Management, the general counsel, the assistant secretary for Environment, Safety and Health, and the cognizant secretarial officer.

DOE 5480.4, *Environmental Protection, Safety and Health Protection Standards*, requires compliance with many regulations and permits, such as Resource Conservation and Recovery Act; Comprehensive Environmental Response, Compensation, and Liability Act of 1980; and National Pollutant Discharge Elimination System. Environmental managers at DOE sites should review their environmental policies and procedures to ensure they adequately address monitoring, sampling, and reporting requirements associated with these permits and regulations. Failure to comply exactly with environmental regulations can result in civil penalties. On March 21, 1996, the Idaho Department of Health and Welfare, Division of Environmental Quality, proposed penalties totaling $317,300 to DOE Idaho for alleged environmental violations. (Weekly Summary 96-14; ORPS Reports ID--LITC-LITCOSITEW-1996-0001 and CH-AA-ANLW-ANLW-1996-0002)

KEYWORDS: sampling, violation, laboratory

FUNCTIONAL AREAS: environmental protection, chemistry, licensing/compliance

ADDITIONAL INFORMATION ON FOLLOW UP ACTIVITIES

1. CORRECTION TO WEEKLY SUMMARY 97-01, ARTICLE 2, DIESEL LUBRICATING OIL INCOMPATIBLE WITH LOW-SULFUR FUEL OIL

The article incorrectly listed the John Fredlund's telephone number as (301) 903-3058. The correct number is (301) 903-3059.

NOTICES UNDER DEVELOPMENT

The Office of Nuclear and Facility Safety encourages input related to the development of Notices. If you have any questions, comments, or information concerning events or issues similar to the following, please contact Mr. Dick Trevillian, Office of Nuclear and Facility Safety at (301) 903-3074 or at Internet address dick.trevillian@hq.doe.gov.

OEAF is currently developing Safety Notices on the following issues:

1. Water Hammer